```
(FILE 'HOME' ENTERED AT 14:07:59 ON 22 APR 2003)
     FILE 'CAPLUS, USPATFULL' ENTERED AT 14:08:12 ON 22 APR 2003
         399667 FILE CAPLUS
L1
L2
         139474 FILE USPATFULL
     TOTAL FOR ALL FILES
         539141 S UVA OR UVB OR (ULTRA? (5A) RADIATION?) OR ("UV")
T.3
         397217 FILE CAPLUS
L4
L5
         117033 FILE USPATFULL
     TOTAL FOR ALL FILES
         514250 S L3 NOT "360"
L6
L7
         398292 FILE CAPLUS
         125418 FILE USPATFULL
_{\text{L8}}
     TOTAL FOR ALL FILES
         523710 S L3 NOT "370"
L9
         397703 FILE CAPLUS
L10
L11
         123154 FILE USPATFULL
     TOTAL FOR ALL FILES
         520857 S L3 NOT "380"
L12
L13
         398550 FILE CAPLUS
L14
         127190 FILE USPATFULL
     TOTAL FOR ALL FILES
L15
         525740 S L3 NOT "390"
L16
         393189 FILE CAPLUS
L17
          98127 FILE USPATFULL
     TOTAL FOR ALL FILES
L18
         491316 S L6 AND L9 AND L12 AND L15
L19
              0 FILE CAPLUS
L20
              O FILE USPATFULL
     TOTAL FOR ALL FILES
L21
              0 S L18 AND ("370" OR "380" OR "390") AND ("310" OR "320")
L22
              0 FILE CAPLUS
L23
              O FILE USPATFULL
     TOTAL FOR ALL FILES
L24
              0 S L18 AND ("370" OR "380" OR "390")
L25
              0 FILE CAPLUS
L26
              0 FILE USPATFULL
     TOTAL FOR ALL FILES
L27
              0 S L18 AND ("370")
L28
             10 FILE CAPLUS
L29
              4 FILE USPATFULL
     TOTAL FOR ALL FILES
L30
             14 S L18 AND ("370NM")
L31
             25 FILE CAPLUS
L32
              9 FILE USPATFULL
     TOTAL FOR ALL FILES
L33
             34 S L18 AND ("370NM" OR "380NM" OR "390NM")
L34
            416 FILE CAPLUS
L35
           3012 FILE USPATFULL
     TOTAL FOR ALL FILES
L36
           3428 S RERADIAT? OR RE-RADIAT?
L37
             61 FILE CAPLUS
L38
            372 FILE USPATFULL
     TOTAL FOR ALL FILES
L39
            433 S L36 AND L3
L40
              0 FILE CAPLUS
L41
              5 FILE USPATFULL
     TOTAL FOR ALL FILES
L42
              5 S L39 AND (SUBBLOCK? OR SUN-BLCO? OR SUNSCREEN? OR SUN-SCREEN?)
L43
            416 FILE CAPLUS
L44
           3012 FILE USPATFULL
     TOTAL FOR ALL FILES
L45
           3428 S RERADIAT? OR RE-RADIAT?
L46
              0 FILE CAPLUS
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L47 8 FILE USPATFULL TOTAL FOR ALL FILES L48 8 S L45 AND (SUBBLOCK? OR SUN-BLCO? OR SUNSCREEN? OR SUN-SCREEN?) 0 FILE CAPLUS L49 L50 3 FILE USPATFULL TOTAL FOR ALL FILES 3 S L48 NOT L42 L51 => s 145 and ("370nm" or "380nm" or "390nm") 0 FILE CAPLUS O FILE USPATFULL L53 TOTAL FOR ALL FILES L54 O L45 AND ("370NM" OR "380NM" OR "390NM")

o the passenger cabin where it is not wanted. Shades or

sun screens positioned

adjacent inside surfaces of windows, such as those taught by Miller, U.S. patent No. 4,790,591,

provide protection against deterioration of interior passenger cabin components, such as plastics,

that are susceptible to ultraviolet light and reduces some heat build-up by reflecting ultraviolet light

back through the window to the outside. However, not only do such shades and sun screens also

absorb solar energy and dissipate such absorbed energy inside the passenger cabin as heat, but much

of the solar radiation reflected by the shades or sun screens back to the window is also absorbed by

the window and results in adding to heat build-up in the passenger cabin, as described above.

ACCESSION NUMBER:

2000061397 PCTFULL ED 20020515

TITLE (ENGLISH):

VEHICLE CABIN COOLING SYSTEM

TITLE (FRENCH):

SYSTEME DE REFROIDISSEMENT D'HABITACLE DE VEHICULE

INVENTOR(S):

, ,,

FARRINGTON, Robert, B.;

ANDERSON, Ren

PATENT ASSIGNEE(S):

MIDWEST RESEARCH INSTITUTE;

FARRINGTON, Robert, B.;

ANDERSON, Ren

LANGUAGE OF PUBL.:

English

DOCUMENT TYPE:

Patent

NUMBER

PATENT INFORMATION:

KIND DATE

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WO 2000061397 A1 20001019

DESIGNATED STATES

```
L189 ANSWER 1 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1994:517308 CAPLUS
     121:117308
DN
TI
     Sunscreens: Development, Evaluation, and Regulatory Aspects
     (Sansukurinzai to Hifu Kagaku: Koshohin no Kenkyu Kaihatsu to Hyokaho
     oyobi Kisei ni tsuite)
     Lowe, Nicholas J.; Shaath, Nadim A.; Editors
ΑU
CS
SO
     (1993) Publisher: (Fragrance Journal Ltd., Tokyo, Japan), 720 pp.
     .yen.16,000. Translated from: Eng
DT
     Book
LA
     Japanese
     62-4 (Essential Oils and Cosmetics)
CC
     Section cross-reference(s): 8
     Unavailable
ΑB
     book sunscreen regulatory
ST
TT
     Sunscreens
        (development and evaluation and regulatory aspects of)
L189 ANSWER 2 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1991:171019 CAPLUS
AΝ
     114:171019
DN
ТT
     Photodegradation of sunscreen chemicals: Solvent considerations
     Shaath, Nadim A.; Fares, Hani M.; Klein, Kenneth
ΑU
CS
     Kato Worldwide, Mount Vernon, NY, 10553, USA
     Cosmetics & Toiletries (1990), 105(12), 41-4
SO
     CODEN: CTOIDG; ISSN: 0361-4387
DT
     Journal
     English
LA
CC
     62-4 (Essential Oils and Cosmetics)
AB
     The degree to which commonly used sunscreens, e.g.,
     benzophenone-3 and benzophenone-8, would degrade when subjected to UV
     light and the effect of solvents on the photodegrdn. were studied. The
     sunscreens were evaluated at the 200-ppm levels at the irradn.
     level 5 min. erythemal dose. Salicylates, Me anthranilate, octocrylene
     and benzophenones showed excellent photostability. The dibenzoylmethanes
     and octyldimethyl p-aminobenzoate showed significant degrdn. in nonpolar
     solvents (mineral oil) and no degrdn. in polar solvents (EtOH/H2O mixt.).
     The sunscreens that showed photostability lacked any significant
     solvent shifts after irradn.
ST
     solvent sunscreen photolysis
IT
     Photolysis
        (of sunscreens, solvents effect on)
IT
     Solvent effect
        (on photolysis of sunscreens)
IT
     Paraffin oils
     RL: BIOL (Biological study)
        (photolysis of sunscreens in relation to)
TТ
     Sunburn and Suntan
        (sunscreens, photolysis of, solvents effect on)
     64-17-5, Ethanol, uses and miscellaneous 110-27-0, Isopropyl myristate
IT
     RL: USES (Uses)
        (photolysis of sunscreens in relation to)
TT
     118-56-9 118-60-5, Octyl salicylate 131-53-3, Benzophenone-8
     131-57-7, Benzophenone-3
                                134-09-8, Menthyl anthranilate
     Octocrylene
                  21245-02-3
                               63250-26-0 96436-87-2, Octyl
                        112725-59-4, Butylmethoxydibenzoylmethane
     p-methoxycinnamate
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (photolysis of, solvents effect on)
L189 ANSWER 3 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1991:171003 CAPLUS
AN
DN
     114:171003
```

```
Stability and efficacy of UV-filters
TI
ΑU
    Shaath, Nadim A.
CS
    Felton Worldwide, USA
SO
    Seifen, Oele, Fette, Wachse (1991), 117(2), 45-7
     CODEN: SOFWAF; ISSN: 0173-5500
DT
     Journal; General Review
LA
    English
CC
    62-0 (Essential Oils and Cosmetics)
    A review with 12 refs., summarizing the author's own work on the effects
AB
     of solvents on the UV absorbance properties of sunscreen compds.
     and their stability to photolysis.
     sunscreen efficacy stability review
ST
     Sunburn and Suntan
TT
        (sunscreens, efficacy and stability of)
L189 ANSWER 4 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1990:558420 CAPLUS
AN
     113:158420
DN
     Interpretation and evaluation: spectroscopic data of sunscreens
ΤI
     Shaath, Nadim A.; Griffin, Peter M.; Andemicael, Gideon I.;
ΑU
     Agrapidis-Paloympis, Louise E.
CS
     Felton Worldwide Inc., Brooklyn, NY, USA
     Cosmetic Science and Technology Series (1990), 10 (Sunscreens: Dev.,
SO
     Eval., Regul. Aspects), 537-607
     CODEN: CSTSEV; ISSN: 0887-6541
     Journal; General Review
DT
LΑ
     English
     62-0 (Essential Oils and Cosmetics)
CC
     A review with 4 refs. Mol. structure, mol. formula, mol. wt., and
AΒ
     operating conditions used to obtain the spectra of sunscreens
     are listed and discussed.
ST
     review sunscreen UV spectra
IT
    Ultraviolet and visible spectra
        (of sunscreens)
IT
     Sunburn and Suntan
        (sunscreens, spectroscopic data of)
L189 ANSWER 5 OF 17 CAPLUS COPYRIGHT 2003 ACS
AN
     1990:558419 CAPLUS
     113:158419
DN
    Modern analytical techniques in the sunscreen industry
ΤI
     Shaath, Nadim A.; Griffin, Peter M.; Andemicael, Gideon I.
ΑU
     Felton Worldwide Inc., Brooklyn, NY, USA
CS
     Cosmetic Science and Technology Series (1990), 10(Sunscreens: Dev.,
SO
     Eval., Regul. Aspects), 505-36
     CODEN: CSTSEV; ISSN: 0887-6541
DT
     Journal; General Review
LA
     English
     62-0 (Essential Oils and Cosmetics)
CC
     Section cross-reference(s): 80
     A review with 26 refs. on methods for anal. of sunscreen chems.
AΒ
     and sunscreen cosmetic formulations.
st
     review sunscreen analysis
IT
     Sunburn and Suntan
        (sunscreens, methods for anal. of)
L189 ANSWER 6 OF 17 CAPLUS COPYRIGHT 2003 ACS
AN
     1990:538299 CAPLUS
DN
     113:138299
TI
     Quality control of sunscreens
ΑU
     Shaath, Nadim A.
     Felton Worldwide Inc., Brooklyn, NY, USA
CS
     Cosmetic Science and Technology Series (1990), 10 (Sunscreens: Dev.,
SO
     Eval., Regul. Aspects), 483-503
```

```
CODEN: CSTSEV; ISSN: 0887-6541
DT
     Journal; General Review
     English
LA
CC
     62-0 (Essential Oils and Cosmetics)
     A review with 15 refs. discussing the various sunscreens used,
AB
     their phys. and chem. properties, and anal.
ST
     review sunscreen quality control
     Quality control
IT
        (of sunscreens)
TT
     Sunburn and Suntan
        (sunscreens, quality control of)
L189 ANSWER 7 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1990:538296 CAPLUS
AN
     113:138296
DN
ΤI
     The chemistry of sunscreens
ΑU
     Shaath, Nadim A.
     Felton Worldwide Inc., Brooklyn, NY, USA
CS
     Cosmetic Science and Technology Series (1990), 10(Sunscreens: Dev.,
SO
     Eval., Regul. Aspects), 211-33
     CODEN: CSTSEV; ISSN: 0887-6541
DT
     Journal; General Review
LA
     English
     62-0 (Essential Oils and Cosmetics)
CC
     A review with 28 refs. discussing the classification of sunscreens
AB
     , mechanism of action and UV filters used, etc.
ST
     review sunscreen
IT
     Sunburn and Suntan
        (sunscreens, chem. of)
L189 ANSWER 8 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1990:484619 CAPLUS
AN
DN
     113:84619
     Cosmetic Science and Technology Series Vol. 10:
TI
                                                      Sunscreens:
     Development, Evaluation, and Regulatory Aspects
ΑU
     Lowe, Nicholas J.; Shaath, Nadim A.; Editors
CS
SO
     (1990) Publisher: (Dekker, New York, N. Y.), 624 pp.
DT
     Book
LA
     English
     62-4 (Essential Oils and Cosmetics)
CC
     Unavailable
AB
ST
     book sunscreen
IT
     Sunburn and Suntan
        (sunscreens, development and evaluation of)
L189 ANSWER 9 OF 17 CAPLUS COPYRIGHT 2003 ACS
AN
     1990:484601 CAPLUS
     113:84601
ĎΝ
ΤI
     Evolution of modern sunscreen chemicals
ΑU
     Shaath, Nadim A.
CS
     Felton Worldwide Inc., Brooklyn, NY, USA
     Cosmetic Science and Technology Series (1990), 10(Sunscreens: Dev.,
SO
     Eval., Regul. Aspects), 3-35
     CODEN: CSTSEV; ISSN: 0887-6541
DT
     Journal; General Review
LΑ
     English
     62-0 (Essential Oils and Cosmetics)
CC
     A review with 71 refs. discussing the use of various sunscreen
AΒ
     chems. and structure-activity studies.
ST
     review sunscreen
     Sunburn and Suntan
IT
        (sunscreens)
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L189 ANSWER 10 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1990:83824 CAPLUS
ΑN
DN
     112:83824
ΤI
     Analysis of sunscreen chemicals. Separation and identification
     techniques
ΑU
     Shaath, Nadim A.
     Felton Worldwide, Brooklyn, NY, USA
CS
     Cosmetics & Toiletries (1989), 104(11), 75-7, 80, 82, 84
SO
     CODEN: CTOIDG; ISSN: 0361-4387
     Journal; General Review
DT
     English
LA
     62-0 (Essential Oils and Cosmetics)
CC
     A review with 13 refs. on TLC, gas chromatog., and HPLC for the anal. of
ΑB
     sunscreens in formulations.
ST
     review sunscreen analysis
ΙT
     Sunburn and Suntan
        (sunscreens, anal. of)
L189 ANSWER 11 OF 17 CAPLUS COPYRIGHT 2003 ACS
AN
     1988:81792 CAPLUS
DN
     108:81792
TΙ
     The effect of solvents on the ultraviolet absorbance of sunscreens
ΑU
     Agrapidis-Paloympis, Louise E.; Nash, Robert A.; Shaath, Nadim A.
     St. John's Univ., Jamaica, NY, 11439, USA
CS
     Journal of the Society of Cosmetic Chemists (1987), 38(4), 209-21
SO
     CODEN: JSCCA5; ISSN: 0037-9832
DT
     Journal
LΑ
     English
CC
     62-4 (Essential Oils and Cosmetics)
AΒ
     The efficacy of sunscreens is often affected by the solvents in
     which they are dissolved. The UV absorption spectra of 13 UVA and UVB
     sunscreens were detd. in 12 solvents of varying polarity and
     cosmetic interest. Changes in both the wavelengths of max. absorbance
     (.lambda.max) and molar absorptivity (.epsilon.) were obsd. for many of
     the sunscreen-solvent systems studied. Obsd. hypsochromic and
     bathochromic shifts in .lambda.max for a no. of sunscreens were
     related to their structure and polarity. Polar solvents shifted the
     .lambda.max of polar sunscreens to shorter wavelengths and
     shifted less polar sunscreens to longer wavelengths.
     Ortho-substituted sunscreen chem., such as salicylates and
     anthranilates experienced a min. or no UV absorbance shift.
     exception of p-aminobenzoic acid, most sunscreens showed
     increased absorbance in both polar and nonpolar solvents and decreased
     absorbance in semi-polar solvents, such as hexylene glycol and C12-15
     alcs. benzoate.
                     The results of this study should aid the cosmetic chemist
     in selecting appropriate solvents and vehicles for sunscreen
     chem.
ST
     UV absorption sunscreen solvent
TT
     Paraffin oils
     RL: BIOL (Biological study)
        (UV absorption of sunscreens in relation to)
IT
     Ultraviolet and visible spectra
        (of sunscreens, solvent effect on)
IT
     Solvent effect
        (on UV spectra of sunscreens)
     Molecular structure-property relationship
IT
        (UV spectra, of sunscreens)
     Sunburn and Suntan
IT
        (sunscreens, UV spectra of, solvent effect on)
ΙT
     65-85-0D, C12-15 alkyl esters
     RL: BIOL (Biological study)
        (UV absorption by sunscreens in relation to)
     107-41-5 110-27-0, Isopropyl myristate 111-77-3 142-91-6, Isopropyl palmitate
IT
                                                110-54-3, properties 110-80-5
```

```
RL: BIOL (Biological study)
        (UV absorption of sunscreens in relation to)
     57-55-6, properties
                            64-17-5, properties
TТ
     RL: PRP (Properties)
        (UV absorption of sunscreens in relation to)
     118-56-9, Homomenthyl salicylate 131-53-3, Dioxybenzone
                                                                   131-57-7,
TT
                  134-09-8, Menthyl anthranilate 150-13-0, PABA
     Sulisobenzone 5466-77-3 6197-30-4 6969-49-9, Octyl salicylate
                  58817-05-3, Octyl dimethyl-p-aminobenzoate
     10377-95-4
                                                                58882-17-0
     112725-59-4
     RL: PROC (Process)
        (UV absorption of, as sunscreens, solvent effect on)
L189 ANSWER 12 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1987:502422 CAPLUS
AN
     107:102422
DN
     On the theory of ultraviolet absorption by sunscreen chemicals
TI
ΑU
     Shaath, Nadim A.
     Felton Worldwide, Brooklyn, NY, 11237, USA
CS
     Journal of the Society of Cosmetic Chemists (1987), 38(3), 193-207
SO
     CODEN: JSCCA5; ISSN: 0037-9832
DT
     Journal; General Review
LA
     English
     62-0 (Essential Oils and Cosmetics)
CC
     A review discussion with 31 refs. on a simplified qual. approach suitable
AB
     for prediction of the direction of wavelength shifts in the UV spectra of
     sunscreens. Wavelength shifts at max. absorption due to changes
in the chem. structure of a sunscreen, or to solvent or pH
     effects in a cosmetic formulation, are discussed.
     review sunscreen UV absorption
st
     Sunburn and Suntan
IT
        (sunscreens, UV absorption by)
L189 ANSWER 13 OF 17 CAPLUS COPYRIGHT 2003 ACS
AN
     1987:464607 CAPLUS
     107:64607
DN
     The analysis of sunscreen chemicals. Part 1. Quality control
TI
     procedures for sunscreen chemicals
ΑU
     Shaath, Nadim A.
     Felton Worldwide, Brooklyn, NY, USA
CS
     Cosmetics & Toiletries (1987), 102(3), 69-72, 76-8, 80-1
so
     CODEN: CTOIDG; ISSN: 0361-4387
DT
     Journal; General Review
LA
     English
CC
     62-0 (Essential Oils and Cosmetics)
     A review with 27 refs. on the quality control procedures required for the
AB
     anal. of sunscreen raw materials.
ST
     review sunscreen quality control
TT
     Sunburn and Suntan
        (sunscreens, quality control of, methods for)
L189 ANSWER 14 OF 17 CAPLUS COPYRIGHT 2003 ACS
     1987:464605 CAPLUS
AN
     107:64605
DN
TI
     Encyclopedia of UV absorbers for sunscreen products
ΑU
     Shaath, Nadim A.
     Felton Worldwide, Brooklyn, NY, USA
CS
     Cosmetics & Toiletries (1987), 102(3), 21-39
SO
     CODEN: CTOIDG; ISSN: 0361-4387
DT
     Journal; General Review
LA
     English
     62-0 (Essential Oils and Cosmetics)
CC
     A review with 6 refs. discussing the phys. snd chem. properties,
AB
     identification, toxicity, etc., of UV absorbers for sunscreen
```

products. STreview sunscreen; UV absorber review ITSunburn and Suntan (sunscreens, UV absorbers, encyclopedia of) L189 ANSWER 15 OF 17 CAPLUS COPYRIGHT 2003 ACS AN 1986:212986 CAPLUS DN 104:212986 ΤI The chemistry of sunscreens AU Shaath, Nadim A. Felton Int., Brooklyn, NY, USA CS Cosmetics & Toiletries (1986), 101(3), 55-62, 64, 67-70 SO CODEN: CTOIDG; ISSN: 0361-4387 DT Journal; General Review English LA CC 62-0 (Essential Oils and Cosmetics) A review with 37 refs. on chem. and photochem. properties of AB sunscreens. Design of sunscreen chems., their anal., and classification are discussed. ST review sunscreen Sunburn and Suntan TΤ (sunscreens, chem. of) L189 ANSWER 16 OF 17 COMPENDEX COPYRIGHT 2003 EEI 1991(2):18600 COMPENDEX DN 910214855 AN Evolution of sunscreen chemicals. ΤI ΑU Shaath, Nadim A. (Felton Worldwide, New York, NY, USA) TMProceedings of the ACS Division of Polymeric Materials: Science and Engineering. MLWashington, DC, USA MD 26 Aug 1990-31 Aug 1990 SO Polymeric Materials Science and Engineering, Proceedings of the ACS Division of Polymeric Materials Science and Engineering v 63. Publ by ACS, Books & Journals Division, Washington, DC, USA.p 598-599 ISSN: 0743-0515 CODEN: PMSEDG PΥ 1990 MN 13632 Conference Article DT TC Application; General Review LA English AΒ The first reported use of sunscreens in the world was in 1928 in the United States with the commercial introduction of an emulsion containing two sunscreening chemicals, benzyl salicylate and benzyl cinnamate. Sunscreens have originated from both academic and industrial research laboratories with completely diverse uses. The cost, safety and marketability of the new filter have had a dramatic impact on the evolution of the current approved list of sunscreen chemicals regardless of their efficacy, degree and nature of their protection.11 Refs. CC 804 Chemical Products; 461 Biotechnology; 741 Optics & Optical Devices; 913 Production Planning & Control CT\*ESTERS: Emulsions; ULTRAVIOLET RADIATION: Filters; CONSUMER PRODUCTS: Raw Materials; BIOLOGICAL MATERIALS:Skin STSUNSCREEN CHEMICALS; CHEMICAL UV FILTERS; COSMETICS L189 ANSWER 17 OF 17 TOXCENTER COPYRIGHT 2003 ACS 1987:136676 TOXCENTER ANCP Copyright 2003 ACS DN CA10708064605M TIEncyclopedia of UV absorbers for sunscreen products ΑU Shaath, Nadim A. CS Felton Worldwide, Brooklyn, NY, USA.

Cosmetics & Toiletries, (1987) Vol. 102, No. 3, pp. 21-39.

SO

CODEN: CTOIDG. ISSN: 0361-4387.

- CY UNITED STATES
- DT Journal
- FS CAPLUS
- OS CAPLUS 1987:464605
- LA English
- ED Entered STN: 20011116
  Last Updated on STN: 20021029
- AB A review with 6 refs. discussing the phys. snd chem. properties, identification, toxicity, etc., of UV absorbers for sunscreen products.
- CC 62-0
- ST Miscellaneous Descriptors review sunscreen; UV absorber review

=>

```
FILE 'MEDLINE, CAPLUS, KOSMET, SCISEARCH' ENTERED AT 15:13:41 ON 22 APR
     2003
           2515 FILE MEDLINE
Ll
L2
           9157 FILE CAPLUS
           1585 FILE KOSMET
L3
           2420 FILE SCISEARCH
L4
     TOTAL FOR ALL FILES
          15677 S SUNSCREEN? OR SUNBLOCK? OR SUN-SCREEN? OR SUN-BLOCK? OR (UV?(
L5
L6
           2142 FILE MEDLINE
Ļ7
           2496 FILE CAPLUS
L8
              3 FILE KOSMET
           2473 FILE SCISEARCH
L9
     TOTAL FOR ALL FILES
           7114 S RERADIAT? OR RE-RADIAT? OR RE-DIRECT? OR REDIRECT?
L10
L11
              O FILE MEDLINE
L12
              0 FILE CAPLUS
L13
              0 FILE KOSMET
L14
              0 FILE SCISEARCH
     TOTAL FOR ALL FILES
L15
              0 S L5 AND L10
     FILE 'USPATFULL, PCTFULL, CAPLUS, PHIC, PHAR' ENTERED AT 15:16:31 ON 22
     APR 2003
L16
            161 FILE USPATFULL
L17
             85 FILE PCTFULL
L18
              O FILE CAPLUS
L19
              O FILE PHIC
L20
              0 FILE PHAR
     TOTAL FOR ALL FILES
            246 S L15
L21
             13 FILE USPATFULL
L22
L23
             11 FILE PCTFULL
L24
              O FILE CAPLUS
L25
              O FILE PHIC
L26
              0 FILE PHAR
     TOTAL FOR ALL FILES
             24 S L5 (3S) L10
L27
                E SHAATH/AU
L28
              0 FILE USPATFULL
L29
              1 FILE PCTFULL
L30
             38 FILE CAPLUS
L31
              O FILE PHIC
L32
              0 FILE PHAR
     TOTAL FOR ALL FILES
L33
             39 S E3 OR E6-E8
     FILE 'AGRICOLA, ALUMINIUM, ANABSTR, APOLLIT, AQUIRE, BABS, BIOCOMMERCE,
     BIOTECHNO, CABA, CAOLD, CAPLUS, CBNB, CEABA-VTB, CEN, CERAB, CIN,
     COMPENDEX, CONFSCI, COPPERLIT, CORROSION, ENCOMPLIT, ENCOMPLIT2, FEDRIP,
     GENBANK, INSPEC, INSPHYS, INVESTEXT, IPA, ... ENTERED AT 15:26:56 ON 22
     APR 2003
L34
              0 FILE AGRICOLA
L35
              O FILE ALUMINIUM
L36
              0 FILE ANABSTR
L37
              0 FILE APOLLIT
              O FILE AQUIRE
L38
              0 FILE BABS
L39
L40
             O FILE BIOCOMMERCE
L41
             O FILE BIOTECHNO
L42
             0 FILE CABA
L43
             0 FILE CAOLD
L44
            38 FILE CAPLUS
L45
              0 FILE CBNB
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```
0 FILE CEABA-VTB
L46
             0 FILE CEN
L47
L48
             0 FILE CERAB
L49
             0 FILE CIN
L50
             1 FILE COMPENDEX
             1 FILE CONFSCI
L51
L52
            0 FILE COPPERLIT
             0 FILE CORROSION
L53
             0 FILE ENCOMPLIT
L54
             0 FILE ENCOMPLIT2
L55
             O FILE FEDRIP
L56
             O FILE GENBANK
L57
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 TOTAL FOR ALL FILES
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L353 ANSWER 52 OF 59 USPATFULL

DETD A sensor 522 could potentially be distracted by all of the reflected rays. Therefore, in accordance with a feature of the present invention, a UV absorbing filter 524 removes all rays except for the desired ones 520 reradiated from material 518 in the the reference grid 507. Note that visible light rays 526 passing through the film 509 and bearing the film image is also passed by the filter 524 and detected by the sensor 522.

PI US 5745143 19980428

ATION IN THE RANGE OF ABOUT

295-315 NM AND BLOCK UVA RADIATION IN THE RANGE OF

ABOUT 365-395 NM.

INVENTOR(S): Fisher; Gary J., Ypsilanti, MI, US

Kang; Sewon, Ann Arbor, MI, US

Voorhees; John J., Ann Arbor, MI, US

PATENT ASSIGNEE(S): Unassigned

AGENT: Hopgood, Calimafde Judlowe & Mondolino, 60 East 42nd

Street, New York, NY, 10165, US

NUMBER PK DATE -----

PATENT INFORMATION: US 2002028185 A1 20020307 APPLICATION INFORMATION: US 2001-900535 20010706

NUMBER DATE -----

US 2000-216244P 20000706 (Provisional) PRIORITY APPLN. INFO.:

FAMILY INFORMATION: US 2002028185 20020307

DOCUMENT TYPE: Utility

Patent Application - First Publication

FILE SEGMENT: CHEMICAL

APPLICATION

NUMBER OF CLAIMS: 10 12 Figure(s).

## DESCRIPTION OF FIGURES:

FIG. 1 depicts an overlay of the wavelength distributions of the noon summer sun, a solar simulator used in the following experiments, and an FS40 brand UV lamp filtered with a Kodacell or WG320 filter.

FIGS. 2A and 2B depict photomicrographs of stained human in vivo skin samples from subjects exposed to varying amounts of solarsimulated radiation, the amounts being defined by the resulting MED.

FIGS. 3A, 3B, and 3C depict the dose-dependent induction of collagenase (MMP-1) (3A) and the 92 kDa gellatinase (3B) as a function of MED, and the reduction in procollagen biosynthesis (3C) also as a function of MED, when using the solar simulator having the radiation profile as shown in FIG. 1.

FIG. 4A depicts our results in determining the wavelengthrelated dependence of collagenase induction.

FIG. 4B shows the wavelengths transmitted through each of a number of different filters.

FIG. 5 shows overlaid the separate wavelengths we obtained using our solar simulator and various filters.

FIGS. 6A, 6B, and 6C depicts the induction of the 92 kDa gelatinase as a function of UV wavelength for various wavelength regions.

FIG. 7 depicts graphically the contribution of each of UVA and UVB to the induction of the 92 kDa gelatinase.

FIG. 8 depicts the variation in the irradiance of the sun between noon and either early morning or late afternoon.

FIG. 9 depicts the UV absorbance of two specific suncreen compositions.

FIG. 10 depicts the induction of collagenase mRNA as a function of UV wavelength in the UVA region.

FIG. 11 depicts the induction of collagenase mRNA as a function of UV wavelength in the UVB region.

## L353 ANSWER 49 OF 59 USPATFULL

[0006] Present sunscreen formulations now include a mixture of SUMM separate compounds for absorbing UVA and UVB radiation. Commercially approved preparations include a UVB blocker, such as a p-methoxycinnamate or an aminobenzoate, and a UVA blocker, such as a benzone or an anthranilate. These compounds generally absorb the incoming UV photon and reradiate a lower energy photon. While typically less cosmetically desirable, physical blockers, such as zinc oxide, generally provide better protection, at least in part because most people do not apply a sufficient amount of sunscreen, or

apply it unevenly. In theory, an amount of 2 mg/cm.sup.2 of sunscreen per skin area is to be applied to maintain the sun protection factor (SPF) value, although the amount typically applied in practice by individuals in recreational settings is much less.

[0034] It may be difficult to formulate a cosmetically acceptable DETD sunscreen for the upper UVA1 region. As described by N. A. Shaath in Sunscreens (op cit.; Chpt. 15), chemical sunscreens, as opposed to physical sunscreens like zinc oxide and titanium oxide, absorb a photon and reradiate the energy as a longer wavelength: very low energy wavelengths over 800 nm as heat (which is small compared with the heat input to the skin from the sun); intermediate energy wavelengths in the visible region (fluorescence), and/or low UV wavelengths (380-450 nm). A sunscreen that appears to fluoresce may be cosmetically unacceptable. Additionally, physical sunscreens can be cosmetically unacceptable because of their whitish appearance. Based on our findings, it will be important to assure that the energy is not reradiated in the region of >360-400 nm, for both UVA sunscreens and UVB sunscreen. Thus, a presently available sunscreen, whether a UVB or a UVA blocker, may reradiate in the region of >360 nm to 400 nm that we have found is harmful to the collagen matrix of the skin. DETD [0035] To formulate a desirable sunscreen, a chemist of ordinary skill in the sunscreen art will first make estimates of the structure of the compound required to absorb in the desired wavelength region, the structure typically focusing on the number and type of conjugated bonds, the presence and/or absence of electron-stabilizing groups, and the like. The candidate compound is then tested in a spectrophotometer to determine at which wavelength(s) it absorbs light (UV here), and then, preferably according to this invention, at what wavelengths the absorbed light is reradiated. As noted, the vehicle/medium in which the compound is dispersed will affect the wavelengths absorbed. For example, for acidic compounds dispersed in an alkaline medium, the medium assists in the formation of anions that tend to increase delocalization of electrons, thereby decreasing the energy required for the electronic transition in the UV spectrum (a "bathochromic" shift to longer wavelengths, here towards the 400 nm range). Likewise, a not strongly polar compound may have an excited state that adds to the molecule's polarity, in which case a polar solvent stabilizes the transition state and a bathochomic shift to longer wavelengths occurs. The more efficient the electron delocalization, the higher the extinction coefficient of the compound. Although it is most desirable to have an absorbtion maximum .lambda..sub.max and extinction coefficient (.epsilon.) not affected by the solvent(s), the medium may be used advanatageously. A molecule may absorb and re-radiate only a few times before it is destroyed, or it may be able to do this many times before being degraded. The efficiency of a candidate sunscreen molecule at absorbing light of a desired wavelength is its extinction coefficient. Further, for a compound that is perhaps less efficient that desirable, it is beneficial to put as much of the compound in the composition to the extent that it does not cause burning or stinging of the skin, is not toxic, and the like. Still further, as mentioned above, these organic compounds typically re-radiate the energy absorbed, sometimes in the infrared, and sometimes in the visible (and sometimes in the low UV region, which we have found is detrimental). While many would not consider a fluorescing compound to be cosmetically acceptable, children, teens, and others may likely consider such a compound as stylish. Further, the use of a compound that reradiates in the visible spectrum would aid in determining

whether a sufficient amount of the compound has been applied, and whether the coverage is complete (e.g., non-covered areas would not fluoresce). Additionally, if the fluorescence is not very strong, it is

less likely that it would be seen in full sunlight.

CLMWhat is claimed is:

> 8. In the manufacture of a sunscreen by determining the absorbance of a candidate compound for particular wavelengths when the candidate compound is dispersed in a given medium, the improvement comprising determining whether said candidate compound reradiates in the region of greater than about 360 nm up to about 400 nm upon exposure to sunlight.

ACCESSION NUMBER:

2002:47994 USPATFULL

TITLE:

INVENTOR(S):

UVA (> 360-400) and UVB (300-325) specific sunscreens

Fisher, Gary J., Ypsilanti, MI, UNITED STATES Voorhees, John J., Ann Arbor, MI, UNITED STATES

Kang, Sewon, Ann Arbor, MI, UNITED STATES

NUMBER KIND DATE \_\_\_\_\_\_\_ US 2002028185 A1 20020307

PATENT INFORMATION:

APPLICATION INFO.:

US 2001-900535 A1 20010706 (9)

NUMBER DATE -----

PRIORITY INFORMATION:

US 2000-216244P 20000706 (60)

DOCUMENT TYPE: Utility FILE SEGMENT:

APPLICATION

LEGAL REPRESENTATIVE:

Hopgood, Calimafde, Judlowe & Mondolino, 60 East 42nd

Street, New York, NY, 10165

NUMBER OF CLAIMS: EXEMPLARY CLAIM:

10

NUMBER OF DRAWINGS:

17 Drawing Page(s)

LINE COUNT: 445

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

(FILE 'HOME' ENTERED AT 15:12:52 ON 22 APR 2003) FILE 'MEDLINE, CAPLUS, KOSMET, SCISEARCH' ENTERED AT 15:13:41 ON 22 APR 2003 L12515 FILE MEDLINE 9157 FILE CAPLUS L2L3 1585 FILE KOSMET 2420 FILE SCISEARCH L4TOTAL FOR ALL FILES 15677 S SUNSCREEN? OR SUNBLOCK? OR SUN-SCREEN? OR SUN-BLOCK? OR (UV?( L5 2142 FILE MEDLINE L6 L7 2496 FILE CAPLUS 3 FILE KOSMET L82473 FILE SCISEARCH L9 TOTAL FOR ALL FILES 7114 S RERADIAT? OR RE-RADIAT? OR RE-DIRECT? OR REDIRECT? L10 L11O FILE MEDLINE L12 0 FILE CAPLUS L13 0 FILE KOSMET 0 FILE SCISEARCH L14TOTAL FOR ALL FILES L15 0 S L5 AND L10 FILE 'USPATFULL, PCTFULL, CAPLUS, PHIC, PHAR' ENTERED AT 15:16:31 ON 22 APR 2003 L16 161 FILE USPATFULL L17 85 FILE PCTFULL L18 0 FILE CAPLUS L19 O FILE PHIC L20 0 FILE PHAR TOTAL FOR ALL FILES L21 246 S L15 L2213 FILE USPATFULL L23 11 FILE PCTFULL L240 FILE CAPLUS 0 FILE PHIC L25 L26 0 FILE PHAR TOTAL FOR ALL FILES L27 24 S L5 (3S) L10 E SHAATH/AU O FILE USPATFULL L29 1 FILE PCTFULL L30 38 FILE CAPLUS L31 0 FILE PHIC L32 0 FILE PHAR TOTAL FOR ALL FILES L33 39 S E3 OR E6-E8 FILE 'AGRICOLA, ALUMINIUM, ANABSTR, APOLLIT, AQUIRE, BABS, BIOCOMMERCE, BIOTECHNO, CABA, CAOLD, CAPLUS, CBNB, CEABA-VTB, CEN, CERAB, CIN, COMPENDEX, CONFSCI, COPPERLIT, CORROSION, ENCOMPLIT, ENCOMPLIT2, FEDRIP, GENBANK, INSPEC, INSPHYS, INVESTEXT, IPA, ... 'ENTERED AT 15:26:56 ON 22 APR 2003 L34 0 FILE AGRICOLA L35 O FILE ALUMINIUM L36 0 FILE ANABSTR L37 0 FILE APOLLIT L38 0 FILE AQUIRE L39 0 FILE BABS L40 0 FILE BIOCOMMERCE L41 0 FILE BIOTECHNO L42 0 FILE CABA L43 0 FILE CAOLD

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L44

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             0 FILE KOSMET
L305
L306
            O FILE METADEX
L307
            O FILE NAPRALERT
L308
            0 FILE NIOSHTIC
            O FILE NTIS
L309
            0 FILE PAPERCHEM2
L310
            O FILE PASCAL
L311
           17 FILE PROMT
L312
             0 FILE RAPRA
L313
L314
             0 FILE RUSSCI
             0 FILE SCISEARCH
L315
             O FILE STANDARDS
L316
             0 FILE TULSA
L317
             0 FILE TULSA2
L318
             0 FILE USAN
L319
             0 FILE WELDASEARCH
L320
L321
             0 FILE WSCA
            0 FILE ADISCTI
L322
            0 FILE ADISINSIGHT
L323
L324
            0 FILE ADISNEWS
            0 FILE BIOBUSINESS
L325
            0 FILE BIOSIS
L326
            0 FILE CANCERLIT
L327
            0 FILE DGENE
L328
L329
            0 FILE DIOGENES
            0 FILE DRUGB
L330
L331
            0 FILE DRUGLAUNCH
L332
             0 FILE DRUGMONOG2
L333
             0 FILE DRUGNL
L334
             0 FILE DRUGU
             0 FILE DRUGUPDATES
L335
L336
             O FILE EMBAL
L337
             0 FILE EMBASE
L338
             0 FILE ESBIOBASE
             1 FILE IFIPAT
L339
             0 FILE LIFESCI
L340
L341
             0 FILE MEDICONF
L342
             O FILE MEDLINE
L343
             0 FILE NUTRACEUT
L344
             0 FILE PCTGEN
             0 FILE PHAR
L345
             O FILE PHARMAML
L346
L347
             0 FILE PHIC
L348
             O FILE PHIN
            0 FILE SYNTHLINE
L349
            0 FILE TOXCENTER
L350
```

13 FILE USPATFULL

L351

L352 0 FILE USPAT2
TOTAL FOR ALL FILES
L353 59 S L5 (5S) (L10 OR DISCIPAT? )